

Rivers of Change Seminar

September 15-22, 2012
Norwich, England, UK

Natural River Design and Restoration —European perspectives and practice

“No man can step into the same river twice,” so says the sage. Rivers constantly change, through natural processes and through the efforts of mankind. How different river systems are managed today—both by altering them and by restoring them—varies around the world by the particulars of the river systems and the perspectives of the people who use them and depend upon them. The European experience offers lessons for American environmentalists and engineers.

The European Union’s (EU) Water Framework Directive requires the restoration of all rivers that fail to achieve “good ecological status.” Improvements should enhance water quality and/or physical habitat. The exceptions are rivers modified to reduce flood risk, to improve land drainage for agriculture, to aid navigation, to generate hydro power or to provide a source of water, which are required to achieve maximum ecological potential. As the majority of rivers in Europe have been altered, few reference reaches are available to guide restoration designs.

The five-day short course will begin in Norwich with a half-day program on natural river design and European restoration legislation. Most of the course will be spent visiting restoration projects across England to illustrate the application of natural river design procedures in a range of river environments. Participants will be able to question the land owners, designers and regulators about each project.



Lectures

Comparing US and EU river restoration objectives and procedures. The EU’s Water Framework Directive legally requires the United Kingdom (UK) to ensure that all main rivers achieve a “good ecological status” by 2015. River restoration in the UK is essentially concerned with transforming stable, artificially modified, channels into natural rivers and re-establishing a natural river dynamic. In contrast, US restoration policies require that rivers be “stabilized.” Illustrating and comparing the two approaches will explore appropriateness, desirability, and feasibility.

Reconciling process and morphological-based river classification procedures. A new river classification system based on natural channel processes explains how rivers develop and why they retain their

morphological characteristics. Given the controlling boundary conditions, namely discharge, sediment supply, bed material transport, and any valley constraints, a river’s morphology is prescribed by its governing processes. As morphologically similar rivers experience the same governing processes, it rationalizes Rosgen’s stream types.



A straight channel created to support agriculture was altered to restore a natural, meandering stream to the ecosystem.

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Natural river design. In the UK, natural channel design procedures based on morphological river classification and reference reach data cannot readily be implemented as most rivers have been artificially modified. A process-based approach, underpinned by river classification, is shown to provide a rational solution for designing natural rivers.

Site Visits

River Blackwater at Reymerston, Norfolk: River was straightened, widened, and dredged in 1805 to aid land drainage and recently diverted to allow for expansion of a gravel pit. The new natural, meandering river maximizes habitat diversity and maintains the river's flood capacity and lowered ground water table. River has an immobile gravel-bed (passive) but it transmits sand delivered from upstream.

River Wensum, Norfolk: Upstream of Norwich 22 miles of river have been designated as a demonstration project to illustrate how to restore chalk fed rivers. River has 13 historic mills along this reach, each with backwater ponds. This is a key project for English Nature (government conservation agency), the Environment Agency (government agency responsible for water quality monitoring, water resource assessments and licensing, flood control, conservation, etc.), and the Norfolk Rivers Trust (nonprofit organization identifying need, obtaining funding, and arranging construction). Work undertaken by Atkins Consulting Engineers.

River Glaven at Hunworth, Norfolk: To mitigate the effects of an irrigation abstraction, 500 metres of an artificially straightened river, characterised by one long run, were restored to a natural meandering state with riffles, runs, pools and glides. The river was constructed without any instream vanes or bank protection meas-

ures. Restoration created perfect habitat for brown trout, water voles, and other species on the EU endangered red list.

River Glaven at Bayfield Hall, Norfolk: Discuss plans to by-pass the lake, formed in 1812 by damming the river, to allow the passage of sea trout upstream. Lake to be by-passed by construction of a natural meandering river. Design also has to prevent silt plus nutrient rich flow from an upstream sewage works, from entering the lake.

River Ribble at Long Preston, Yorkshire: The River Ribble, which rises in the Pennines, flows west into the Irish Sea. Throughout its course it actively transports bed material. We will visit a site where the river had been straightened and embanked through a major wetland (Site of Special Scientific Interest). Following removal of the earth embankment, the river is simply being encouraged to meander and establish a natural dynamic with bank erosion, bar deposition and meander migration.



Eden valley, Cumbria: Visit restoration projects undertaken by the Eden Rivers Trust.

Derwent valley, Lake District National Park, Cumbria: This valley was devastated by a rare flood event

two years ago. Cockermouth was inundated with about 6 feet of flood water and the flooding washed away bridges. The river was ripped apart by the flood, and thick gravel deposits covered large areas of the flood plain. Examine and discuss river engineering solutions with the Environment Agency, consulting engineers and Cumbria County Council Highway engineers. ●

To register for the 2012 *Rivers of Change* Seminar in Norwich, England, complete the registration form and submit with a deposit to Resource Institute, Inc.

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Visitor Attractions

Saturday 15th September 2012

On arrival at **Norwich Airport**, our coach will collect you and take you to the **Maids Head Hotel** in the centre of **old Norwich**. Use the rest of the day to explore Norwich. The **Cathedral**, set within its historical precinct adjacent to the river, is within 300 yards. The **Norman Castle**, dating from 1100 is located uphill but within a short stroll of the hotel. A **medieval cobbled street, Elm Hill**, leads from the hotel toward the **historic open market** in the heart of the city. View the city Hall and an **ancient Guildhall**. Shops abound within this **pedestrian-friendly** central area.



Sunday 16th September 2012

Our coach will collect us all mid-morning for an excursion to the **Norfolk Broads** and the coast. A network of rivers linking a number of man-made lakes together with their associated flood plains constitutes the area known as the Broads. The lakes were formed when the peat diggings flooded in the 14th Century. This **wetland area** has been designated a Ramsar site (Convention on Wetlands of International Importance, Ramsar, Iran, 1971) and has the status of a **national park**. The rivers are navigable and are extensively used for recreational boating. **Conservation** preserves and sustains this unique area. The **Norfolk coast** is quite varied. To the



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northwest, 150-foot high cliffs of unconsolidated glacial sediments are prone to mass failure; since the medieval period numerous **villages have disappeared** over the edge. At the coast, eroded sands and gravel are swept south. The low-lying land, fringed by **sand dunes**, has experienced severe tidal flooding as recently as 1953.

Saturday 22nd September 2012

Leaving from Penrith

The tour ends in Penrith on Saturday, September 22, but you can continue from Penrith on your own to explore more of the UK, if you like. Or return by coach to Norwich for departure.

If travelling independently to explore Scotland, Ireland, Wales and England. Travel by rail or car from Penrith, you have choices:

Rail Travel

Connections from Penrith to the whole UK rail network. Check www.nationalrail.co.uk for destinations, travel times and costs. Discounts for advanced booking. Rail cards available.

Rental Car (Car Hire)

In Penrith, *Enterprise* is the only national car hire company offering a range of cars. (Google "car hire Penrith, UK" or try www.enterprise.co.uk and specify Penrith as the location.)

Sights to see if travelling on

Scotland

Edinburgh: cosmopolitan and **historic city**. Often called to as Old 'Reekie' referring to the time when the city was wreathed in a pall of smoke from domestic fires. **Old town** (16th century) built on top of an even older town (visit the houses



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underneath the old town and see the ghosts). **New town** of 1790's in more Regency style. Also Castle, Royal Palaces and art galleries to explore. (90 mins by train from Penrith....by car take the scenic route across the Southern Uplands via Peebles in the wonderful Tweed valley). **From Edinburgh** you can travel north to visit St Andrews for a game of **golf**, go **fly fishing** on the River Spey and enjoy the scenery of the Cairngorm Mountains.

Glasgow: formerly a major industrial city noted for **ship-building**. Now gentrified following it being Europe's **City of Culture** a few years ago. (90 minutes by train from Penrith). Stepping stone to the **Western Highlands** and also the islands via the port of Oban. Mountains were joined to the Appalachians eons ago. Wonderful **glacial scenery** with sea lochs, including **Loch Ness** with monster and a magnificent **coastal railway** journey up the west coast. Do not forget to visit some distilleries to sample the **Scotch whisky** along the route. (Except for Scotch and Canadian distilled spirits, whiskey is spelled with an "e.")

England

London: a vibrant city full of wonderful things to do and see. Visit the **Tower of London** to see the **Crown jewels**, marvel at Tower Bridge, see the Trooping of the Colour at **Buckingham Palace** when the guard is changed, arrange to see inside the **Houses of Parliament**, relax in the many parks, feel the history in **St Paul's Cathedral** and **Westminster Abbey** and do not forget to take in a show and visit some museums and art galleries. Nobody does history and heritage as well as the British! (Train from Penrith takes about three-and-half hours).

Cambridge and Oxford: each an hour by train from London. Both are amazing cities steeped in **academia** with **architecture** to match. Take a **punt ride on the river** and soak up the atmosphere.

Stratford on Avon: a must for those into the works of Shakespeare, the Bard.

Bath: a remarkable compact Regency city



with the elegant Georgian houses built in cream coloured bathstone. The **Abbey** and **Roman Baths** add to the attractions.

York: historic city with **Roman** and **Viking** remains. At its centre is a magnificent **Minster** and the old

town is surrounded by a medieval city wall. Do not miss the **Castle Museum** or the underground **Jorvik Viking Centre** and its "time train."



Lake District National Park: lies just to the west of Penrith. Stunning **glacial scenery**.

Yorkshire Dales National Park and the **North York Moors National Park;** see

the landscape that was the film set for "All Creatures Great and Small" and the cliffed coastline between Whitby and Flamborough Head.



Wales

A country endowed by castles, particularly in the North West at Conway, Caernarvon and Harlech. Try the coastal walk in **Pembrokeshire National Park** or hike through the mountains in **Snowdonia**.



Ireland

Northern Ireland: spectacular coastal scenery, particularly the **Giant's Causeway**. (Ferry from Stranraer in S.W. Scotland to Belfast in N. Ireland is easily accessed from Penrith)

Dublin: the partying city, which is also the capital of Ireland, is fuelled by **Guinness**. Use Dublin as the gateway to the wonderful west coast including **Killarney** and the **Ring of Kerry**.

Europe—Your choice!

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Seminar Registration Form

Print this form, fill out, and fax to Resource Institute, Inc. at (336) 750-0177 or mail to the address below.

Name: _____

Agency, company, or professional affiliation: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

E-mail: _____

Number of travel companions in your travel party (excluding you): _____

Names of travel companions (i.e., not attending seminar) traveling in your party:

Fee includes:

Group airfare from New York City (departure Friday, Sept. 14) to Norwich (arrival Saturday, Sept. 15); coach transport on arrival in Norwich from airport to hotel; excursion by coach on Sept. 16 to Norfolk Broads and Coast; coach transport on last day from hotel to Norwich airport; coach travel during seminar; hotel accommodations daily including breakfast and evening meal at hotel; lunches for five class days during seminar and on excursion to Norfolk Broads during mid-morning to mid-afternoon.

Participants have free time on Saturday and Sunday during arrival weekend, September 15/16. Coach returns to Norwich on Saturday, Sept. 22 for departure on Sunday, Sept. 23.

Participants wanting to extend their stay can make those arrangements through the groups' travel agent Gigi Phillips, Aladdin Travel & Meeting Planners, (336) 499-6772. www.aladdintravel.com

Travel, lodging, meals as described plus the five-day seminar is just **\$4,200**. Travel companion fee (without the seminar) is \$3,400. (**Save \$250 each when registering by May 18, 2012**. Pay just \$3,950 and \$3,150.)

Deposit of \$1,000 per traveler holds spot. Space on coach is limited. Master Card or Visa accepted.

Credit card number: _____ Expiration Date: (mm/yy) _____

Amount: \$ _____ Cardholder signature: _____

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